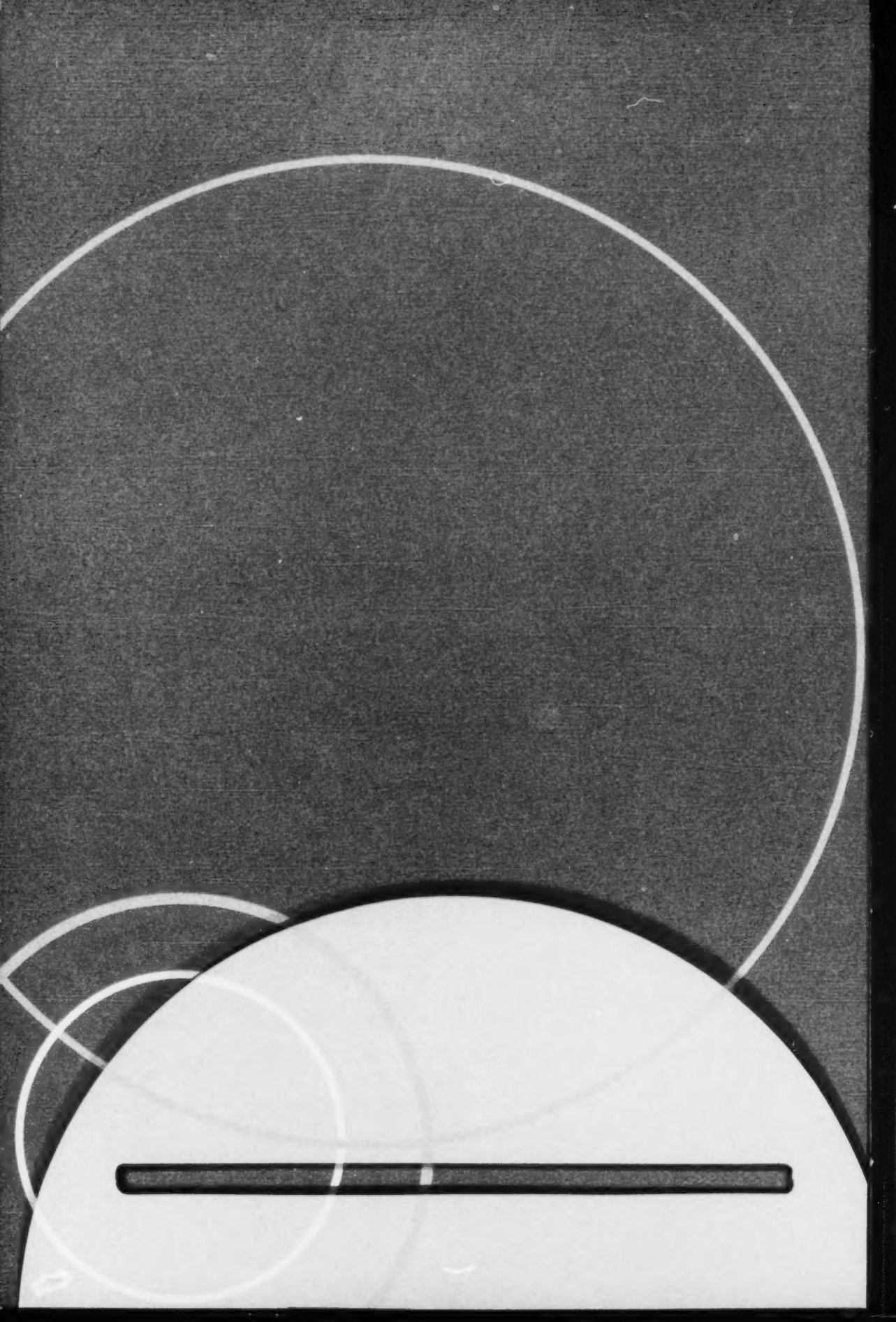
Too Good to Waste

MAKING CONSERVATION A PRIORITY

Alberta



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at least

80%

of material currently sent to municipal landfills
can be recovered

Introduction

Every society produces residual material, or what is commonly known as waste. Waste tends to be an indicator of economic success – the more prosperous society becomes, the more waste we generate. As we move into the future, how we reduce waste and fully utilize our resources will be a more relevant measure of success.

Over the years, Alberta's main approach to managing its waste has been through disposal, primarily through landfills. However, as development has progressed, and technologies have improved, there are many more approaches to waste management that are now available. Opportunities are growing and Alberta must take an innovative approach to waste reduction and management.

Too Good To Waste is Alberta's road map for waste reduction and management. It identifies the issues and opportunities, and outlines the outcomes, strategies and priority actions to help Alberta advance innovative waste management programs in the future. More detailed plans will be developed for specific actions in consultation with stakeholders as we journey ahead.

ALBERTA'S CURRENT WASTE SITUATION

In Alberta, a number of waste management practices are used – these include waste reduction, re-use, recycling and disposal.

Waste management practices, in Alberta, currently favour landfilling because:

- the potential environmental, social and human health costs of producing, treating and disposing of wastes are not necessarily reflected in waste disposal fees; and
- innovative, cost-effective waste reduction options tend to be developed only when waste disposal options become more limited.

Fact

Waste generated in Alberta can be grouped into five broad waste sectors:

> Municipal solid waste
> Hazardous waste
> Oilfield waste
> Forestry residuals
> Agricultural residuals

20
per cent
80
per cent

Waste Management Hierarchy

Waste Reduction
Reduction in the generation of waste through pollution prevention and the more effective use of natural resources is often the most cost-effective waste management option in the long-term.

Re-use
This involves items being used again for the same or different purposes with the objective of long-term cost savings.

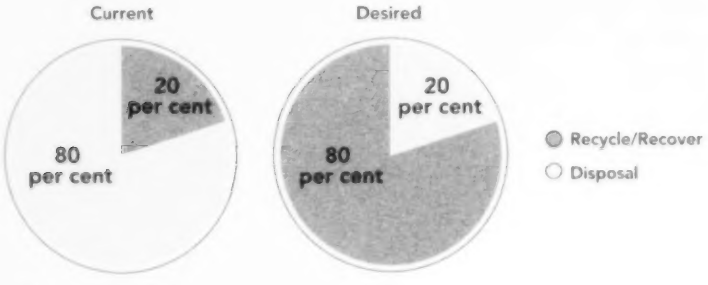
Recycling
Value should be recovered through recycling, composting, refining, or other processes where appropriate. Energy recovery should be considered for materials with high heat value and no recycling options.

Disposal
Landfilling, deep well injection and incineration without energy recovery are examples of alternatives when other options are not feasible.

Alberta must strive to move waste management practices up the waste hierarchy towards a more sustainable position.

Our challenge is to work towards reversing the current waste profile and ultimately work towards a Zero Waste Society.

Municipal Waste Profile



Alberta Leads the Way

Alberta has achieved significant results in waste management over the past 30 years. Alberta has been one of the first provinces in Canada to implement many successful waste management programs, such as:

- a beverage container collection system (1972)
- a pesticide container collection program (1980)
- hazardous waste legislation (1985)
- tire recycling program (1994)
- a used oil materials recycling program (1997)
- an electronics recycling program (2004)

Working with Stakeholders

Alberta Environment has been working with stakeholders primarily from the waste management community over many years to reduce waste and to improve waste management in Alberta.

A Waste Management Stakeholder Group (WMSG) was formed in 2003 to provide direction to the provincial government regarding specific improvements to resource recovery and waste management in Alberta. Discussions amongst the WMSG have focused on improving waste management in Alberta – building on our current strengths. The outcomes, strategies and actions within *Too Good to Waste* have been generated, in large part, due to the discussions and recommendations made by the WMSG. Continued collaborations with the WMSG will be undertaken to develop implementation plans for the strategies identified in *Too Good to Waste*.

WHY DOES ALBERTA NEED A WASTE STRATEGY FOCUSED ON CONSERVATION?

There are many social, economic, and environmental reasons for developing a roadmap that supports innovative approaches to waste management, recycling and resource recovery. Key reasons include the following:

- Resources are becoming scarcer and more valuable. Resource pressures will continue to increase into the future.
- Technology is continuing to improve and there are environmentally sound methods to recover value from materials currently being discarded.
- Addressing waste has environmental as well as resource benefits. A number of major waste management issues contribute to broader environmental issues such as air pollution and greenhouse gas production.
- Recovering value can provide economic opportunities for industrial waste generators, municipalities, and businesses, as one industry's "waste" becomes another industry's feedstock.

Fact

There are significant costs associated with the disposal of waste under Alberta's current approaches. Statistics Canada waste management expenditures for Alberta municipalities were:

> 1996: $101,272,000
> 1998: $105,586,000
> 2000: $148,594,000
> 2002: $152,387,000
> 2004: $181,367,000

Innovative Waste Management is a Government of Alberta Priority

Too Good to Waste is consistent with Alberta's 20-year strategic plan. It provides a framework and long-term commitment to resource conservation and environmental protection while recognizing Alberta's accomplishments and strengths.

There are a number of strategies that have been developed to accomplish the Government's 20-year strategic plan. *Too Good to Waste* is intended to complement and facilitate a number of other broader strategies such as:

- *Albertans and Climate Change: Taking Action* – increasing the amount of waste materials that are recycled, and reducing the disposal of organic residuals at municipal landfills reduces the generation of greenhouse gases and supports Alberta's Climate Change Strategy;
- *Rural Development Strategy* – optimizing the use of agricultural and food residuals will enhance Alberta's value-added agricultural and food industries;
- Alternative energy initiatives that can be supported through the use of agriculture and forestry residuals; and,
- Supporting *Water for Life: Alberta's Strategy for Sustainability* through improved land application practices by optimizing the return of organic residues to land through composting.

PRINCIPLES FOR WASTE MANAGEMENT AND RESOURCE UTILIZATION

Alberta Environment has adopted five principles for moving forward with environmental management. A summary of how these principles apply to waste management and resource utilization is provided below and will be considered as strategies are discussed and implemented.

Government Wide Vision and Implementation

Resource utilization and waste management outcomes will be the same for all materials that share the same characteristics, regardless of the legislation under which these wastes are controlled. Alberta Environment will take the lead role in coordinating and ensuring the compatibility of policies and approaches that have implications for environmental quality. Cross-Ministry and stakeholder collaborations will be integral to policy development.

Best Practices/Continuous Improvement

Resource conservation and waste minimization programs and initiatives will be reviewed regularly to ensure they are consistent with best practices and continual improvement. Accountability and adaptation will be key components of Alberta's waste management system.

Place-Based Approaches

The Alberta government recognizes that needs and priorities will not be the same in all areas of the province, nor for all waste sectors. Policies and programs must consider differences between these areas including variations in population, types of development, and geography without compromising the assurance of provincial outcomes.

Flexible Tools and Incentives

Outcomes will be achieved by promoting preventative approaches; providing incentives as well as penalties; using economic instruments; and developing innovative mechanisms and approaches. The development of tools and incentives will be a shared responsibility along with the development of performance measures and evaluation tools to ensure progress towards outcomes.

Shared Responsibility

The Alberta government recognizes the shared responsibility of municipalities, waste generators, resource managers and the waste management industry in promoting and maintaining excellence and high standards in the achievement of outcomes.

OUTCOMES

Based on consultations with the Waste Management Stakeholder Group and to focus the strategies of *Too Good to Waste*, three broad outcomes have been identified for waste management in Alberta:

1. Albertans take responsibility for **resource conservation and waste minimization**.
2. **Waste management systems are integrated** to provide the capacity for processing and/or recovery of materials that would otherwise be disposed of as wastes.
3. Facilities and practices to manage secondary materials and wastes **are protective of air, land, water and human health**.

These outcomes are supported individually by a number of strategies and actions that are described in detail in the following section.

Outcomes, Strategies and Actions

Outcome 1:

IMPROVED RESOURCE CONSERVATION AND WASTE MINIMIZATION

Critical to the achievement of this outcome is for all Albertans to take responsibility for resource conservation and waste minimization through their own practices and through their support for industries, communities, and initiatives that optimize resource utilization.

Alberta has always supported resource conservation through waste minimization, but our primary focus has been on environmental and human health protection. Our current disposal infrastructure was built to address the health and environmental threats from waste.

Approximately $80M of provincial funds and many more millions of municipal funds have been used to ensure that Alberta has safe municipal landfills. Alberta began regionalizing its municipal landfill system in the 1970s so that, instead of small municipal "dumps" throughout the countryside, regional landfills with a network of transfer stations would consolidate waste. This allowed for the cost-effective development of engineered landfill sites. A network of private landfills has developed in addition to municipal landfills to manage wastes from specific industrial sectors (particularly the oil and gas sector) and to meet the needs of commercial waste generators.

Subsidization of disposal infrastructure has made landfill disposal very economical for waste generators[1]. Private landfills "compete" with each other and municipal landfills for waste, which also tends to keep tipping fees low. Alberta's low tipping fees further encourage disposal over recovery. Unless disposal fees increase, there is little incentive for businesses to get involved in resource recovery.

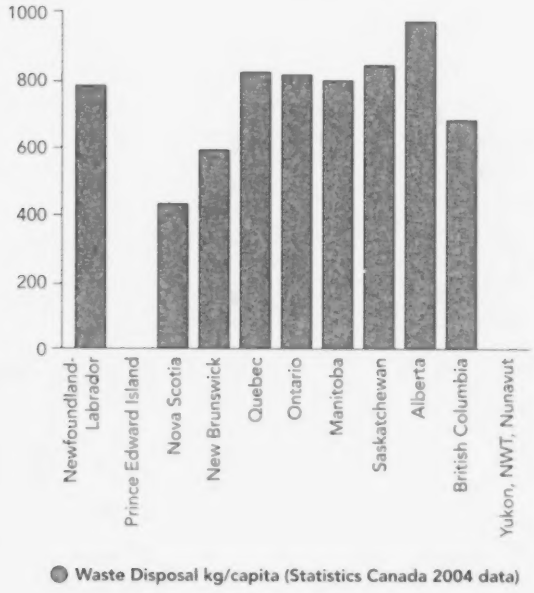
There has been little incentive for industry, manufacturers and consumers to reduce waste generation and disposal. Waste has traditionally been viewed as somebody else's problem. We have become, increasingly, a throwaway society. Alberta has been under additional pressures because of its booming economy. Diversion programs for specific waste streams have been introduced to solve specific problems. These programs have been successful, but they haven't addressed the bulk of waste currently being landfilled.

The result is that Alberta leads the country in the per capita disposal of municipal solid waste[2].

[1] Funding for diversion infrastructure by the province to date is less than 15% of allocations for disposal.

[2] Municipal solid waste includes residential; industrial/commercial/institutional; and construction and demolition wastes.

Municipal Solid Waste Disposal in Canada



Note: Data for Prince Edward Island, Yukon, NWT and Nunavut were suppressed to meet confidentiality requirements of the Statistics Act.

Strategy *The Alberta government will provide leadership in minimizing the environmental footprint of government operations and assuring that our resources are utilized to their best advantage.*

Stakeholders were clear that government must set an example for Albertans. The purchasing power of government agencies is significant. Government purchasing policies can provide a "leg up" for industries developing new products from recovered materials. The Alberta government's established reputation for responsible fiscal management can be extended to "waste elimination."

Actions

- Develop and implement green procurement and pollution prevention and conservation policies for provincial government operations.
- Support and participate in recognition programs such as the Leadership in Energy and Environmental Design (LEED) program.
- Continue developing policies to ensure the conservation and optimal use of Alberta's forest, agriculture and oil and gas resources as part of Sustainable Resource and Environmental Management.

Strategy *Reduce municipal solid waste in Alberta.*

It is time to reassess the overall strategies for waste reduction in Alberta. It is unlikely that the current target of reducing the amount of municipal solid waste going to landfills to 500 kg per person by the year 2010 will be achieved. Approaches to date have relied primarily on the voluntary actions of industry, municipalities and organizations. While this strategy has led to some waste reduction and diversion from landfills, further improvements are unlikely without more progressive actions. AENV, in consultation with stakeholders, needs to look at all the tools and initiatives available in the context of a long-term plan.

Actions

- Continue provincial public awareness and education to generate awareness of resource conservation and waste reduction.
- Develop economic instruments to discourage waste generation and disposal.
- Develop disposal bans where necessary to facilitate waste reduction initiatives.
- Incorporate full cost accounting into waste management policies to ensure that waste generators pay the full cost of waste disposal.

Strategy *Continue to develop, implement and improve stewardship programs.*

Environmental stewardship, at its heart, involves each of us caring for our land, air and water, and is a complex blend of ethics, awareness, education and action. Stewardship programs may be voluntary or regulated, public or private, and involve individual activities or national endeavours. As we move towards the goal of reducing the amount of waste sent to landfills, stewardship programs will play an even greater role in waste reduction efforts. A strong, responsible province-wide approach will help protect and conserve our resources.

Actions

- Work with existing stewardship programs to increase recovery and recycling rates for beverage containers, used oil, scrap tires, and electronics.
- Develop performance measures beyond recovery rates (e.g. cost effectiveness, economic benefits) and monitor the effectiveness of regulated and voluntary stewardship programs.
- Continue to develop and implement regulated stewardship programs for targeted materials.
  - Develop and implement a paint stewardship program and develop additional stewardship programs to address household hazardous wastes and special wastes.
  - Develop and implement a packaging and printed material stewardship program.
  - Develop and implement a stewardship program for the recovery of construction and demolition waste.

Strategy *Ensure continual improvement through policy and program evaluation.*

The evaluation and continual improvement of Alberta's waste management system is critical in achieving resource conservation outcomes. The right information must be collected and analyzed to help inform decisions about existing initiatives, projects, programs and policies, and to make informed choices regarding future initiatives.

Information regarding waste management has traditionally focused on specific sectors (municipal, hazardous, oilfield, forestry and agriculture). As we move forward we need to ensure that information reflects waste management and resource utilization as an integrated system.

Actions

- Incorporate reporting, information collection and evaluation as an integral part of Alberta's resource recovery and waste management system.
- Set recovery targets for specific materials along with reliable reporting systems to allow for appropriate measurement.
- Evaluate policies and programs to ensure that resources are utilized to their highest value and that resource recovery programs are providing intended benefits.
- Ensure best practices for resource conservation and waste reduction are identified, shared and implemented broadly across the province.

Outcome 2:

INTEGRATED RESOURCE RECOVERY AND WASTE MANAGEMENT SYSTEMS

Alberta needs to move towards a resource recovery system where waste management centres provide the capacity for processing and/or recovery of materials that are currently disposed of as wastes.

Stakeholders recommended that Alberta Environment provide a flexible set of environmentally sound waste management tools to allow different regions of Alberta to meet resource recovery/waste management needs and priorities in specific areas. Environmental protection must be assured – risk must not be redistributed from one environmental medium or one geographic area to another as the transition to an integrated resource recovery system is made.

One option may be development of environmentally sound options for specific waste materials, assessed and ranked against a set of agreed-to criteria. Each option could then be tied to an incentive or disincentive, which would provide motivation to choose certain options over others.

Waste management regions or authorities would be able to determine their recovery/waste management integration needs in conjunction with broader waste management targets and performance measures instituted on a provincial basis.

The development of a resource recovery infrastructure for Alberta has tremendous potential to turn some of our most problematic "wastes" into "resources".

The **agricultural** sector produces the greatest volume of residual material in Alberta. Most agricultural residuals are recovered for application back to land (e.g. manure, straw) or for further processing (e.g. meat and bone meal, livestock bedding, compost). There is growing interest in exploring opportunities for greater value-added uses of these materials as "feed stocks" into the production of energy and bio-products. Alberta Agriculture's Rural Development Strategy is looking at opportunities that may also provide for the use of municipal and forestry residuals in conjunction with agricultural residuals.

The **forest production and wood processing** industry produces a large volume of wood residues. This sector is striving to enhance recovery and optimize use of recovered material by developing bio-products and bio-energy options for residual materials.

Municipal solid waste (MSW) contains a large percentage (approximately 40 per cent) of diverse organic materials such as leaf and yard waste, vegetable processing wastes, table scraps, etc.

Many organic MSW materials can be composted to produce a soil amendment that can be used to increase nutrient holding, water holding, and to act as an adsorbent for contaminants. The material is useful on urban landscapes, roadsides, reclamation areas and farmland. Municipal composting operations can incorporate agriculture and forestry residues where these materials are close at hand. Forestry residues such as composted bark are already in high demand for use as mulch in urban landscapes.

Organic material that cannot be recycled or composted still has value – as an energy source. The technology being implemented by agriculture and forestry sectors can be used to extract energy value from organic residues. Smaller communities may be able to take advantage of this technology by working with agriculture or forestry interests. Additional opportunities arise from the ability to use woody biomass, particularly willows, to filter and clean municipal wastewater from sewage treatment or storm water drainage and then harvest this material for energy production.

Strategy *Develop sustainable resource recovery infrastructure.*

Over the past 30 years, Alberta has supported the necessary development of waste disposal infrastructure in the province. We now need to focus provincial investment into resource recovery so we can "catch up" on developing this important infrastructure. There are a number of organizations currently supporting research and innovation to reduce operating costs, capture more value from a resource, or reduce environmental liabilities. Government policies need to support resource conservation and optimal resource use.

Actions

- Identify infrastructure requirements to support a resource recovery system across Alberta.
- Develop options for funding resource recovery infrastructure linked with policies and economic tools to encourage resource recovery and discourage disposal as waste.
- Develop policies, including economic incentives, to support research, development and demonstration of new or improved technologies.

Goal *Work towards a goal of integrated resource recovery/waste management facilities.*

The Government of Alberta is committed to completing the development of regional landfills through its existing programs; however, there is a need to shift towards supporting recycling, composting, and resource recovery programs and infrastructure.

There has been considerable analysis of municipal solid waste streams nationally, provincially and municipally. At least 80 per cent of material currently disposed of at municipal landfills can be put to some productive use. Stakeholder discussions identify the continuing need for some landfill capacity. For some wastes, landfills provide the only environmentally sound management option.

Actions

- Establish waste management regions to reflect natural boundaries for the transfer of residual materials within Alberta.
- Develop comprehensive waste management plans for integrated resource recovery and waste management across different sectors (industrial, municipal, oil and gas, forestry, agriculture) in each waste management region.
- Allow waste management regions to meet resource recovery/waste management needs and priorities through the implementation of options and tools, and the development of infrastructure best suited to regional needs.
- Link provincial funding and support for regional waste management plans to provincial outcomes and policies regarding resource conservation and waste management.

Outcome 3:

PROTECTION OF AIR, LAND, WATER AND HUMAN HEALTH

The facilities and practices used to manage residual materials and wastes must be protective of air, land, water and human health.

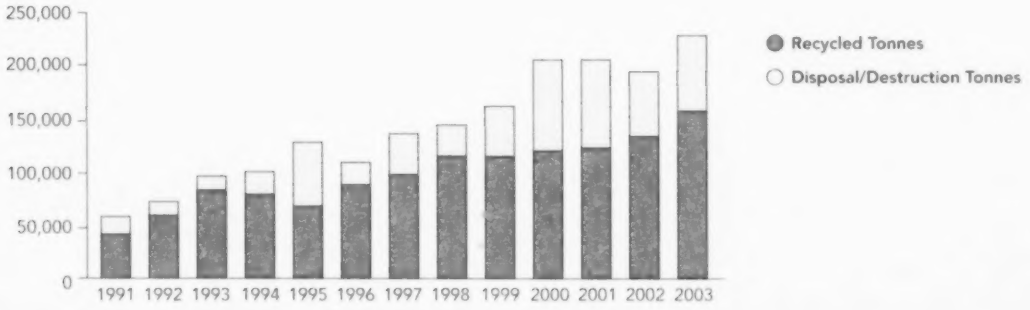
As indicated previously, environmental protection has been the primary focus of waste management in Alberta. Environmental protection will be enhanced through the diversion of municipal, agricultural, and forestry residuals from landfills into appropriate recovery technologies. Infrastructure for both waste management and recovery needs to be carefully managed to ensure that environmental protection is not compromised. Three areas of waste management requiring specific attention to ensure environmental protection follow: hazardous waste; contaminated soil and land application. These areas in particular must be managed to ensure environmental protection as a first priority.

Hazardous Waste

Hazardous waste represents less than 10 per cent of the solid waste generated in Alberta. However, hazardous waste needs special attention to ensure that risks are managed appropriately. Hazardous waste includes materials that are toxic (e.g. leftover pesticide concentrates), flammable (e.g. solvents), corrosive (e.g. strong acids), or reactive (e.g. metallic, sodium or magnesium).

Hazardous waste generation in Alberta is increasing (see graph below). The majority of hazardous waste is recycled. Information regarding hazardous waste recycling is limited. A more detailed analysis of recycling options for high-risk, high-volume hazardous waste streams needs to be conducted to determine the most appropriate option for dealing with these materials. Efforts need to focus on avoiding the use and generation of substances that display hazardous characteristics – particularly where those characteristics are persistent after treatment or disposal. A reduction in the use and generation of hazardous materials will lead to safer industries and safer communities through reduced transportation and handling. As we make progress towards this goal, we need to ensure that hazards are addressed.

Hazardous Waste Generation and Recovery In Alberta (1993-2003)



Contaminated Soil

Contaminated soil is, by weight, Alberta's single largest waste stream. A number of private landfills operate specifically to receive contaminated soil. It is estimated that at least 3,000,000 tonnes of contaminated soil are landfilled in Alberta annually (accurate information regarding contaminated soil disposal is currently limited). Contaminated soil results primarily from oil and gas development, petroleum storage (underground storage tanks), industrial development, and accidental spills[1]. Much of the soil contamination in Alberta is a "legacy" from times when environmental protection standards were less stringent. As former industrial areas have come under re-development, contaminated soil has needed to be remediated or removed. Environmental practices have improved, but industrial development has increased – contaminated soil will continue to require our attention for some time. There is some potential for the remediation or beneficial use of some contaminated soil depending on the type and degree of contamination. In some cases, however, landfilling of contaminated soil will be the best option.

Land application

A significant volume of residual materials (an estimated 1,000,000 dry tonnes annually, not including agricultural manure applications) is applied directly to land every year. This includes applications of residues from septic tanks, drilling waste, compost, wood ash, hydrocarbons, biosolids from sewage treatment plants and pulp sludge. Some of this material provides a benefit to land. Most of the material, however, includes some component that is not beneficial to land. Information regarding the area of land affected by direct land application is not readily available because of the widespread nature of this practice and the fact that very few records are required for most of the materials applied to land.

[1] The Wabamun train derailment resulted in the recovery of approximately 360,000 litres of petroleum products from the spill area. Approximately 22,000 tonnes of contaminated soil was landfilled.

Strategy *Continue to enhance standards for waste management.*

Managing environmental and human health risks must remain a priority as Alberta develops a resource recovery system. Environmental performance standards for resource recovery and waste management operations must continue to meet a high standard and comply with national and international agreements.

Actions

- Update hazardous waste management policies to include treatment to ensure a high standard for environmental protection.
- Implement new environmental standards for landfills and composting.
- Develop an over-arching policy for energy recovery from waste in conjunction with Alberta's bio-energy and alternative energy development. Ensure that the policy addresses concerns posed by organic residuals, supports bio-products development, reduces greenhouse gas production and ensures environmental protection.

Strategy *Continue to minimize risk to environmental and human health.*

Alberta has developed an environmentally sound waste management system. We want to improve that system. Stakeholder discussions have reinforced environmental and human health protection as the "bottom line" as we move from waste disposal to resource utilization.

Actions

- Enhance pollution prevention initiatives to reduce hazardous waste generation and encourage recycling.
- Enhance hazardous waste reporting to ensure that information regarding hazardous waste disposal and recycling is available to evaluate hazardous waste management.
- Protect land quality by evaluating management practices for excavated soil, contaminated soil and the land application of residual materials to ensure that land is not degraded and that soil and residual materials are used to their best advantage.
- Develop a publicly accessible database of former known landfill locations for use by land purchasers and developers.

Strategy *Revise and update legislation to focus on the achievement of environmental outcomes.*

Alberta Environment is responsible for province wide legislation, regulation and guidelines for various wastes under the *Environmental Protection and Enhancement Act*, the *Substance Release Regulation*, and the *Waste Control Regulation*.

Recovery technologies will be diverse to accommodate different waste streams. Alberta must move towards an outcome-based regulatory system that specifies environmental performance targets without limiting technologies that can meet these targets. Support for the development and implementation of new technologies must be developed to ensure that technologies selected will meet stringent performance standards.

Actions

- Revise existing legislation concerning waste management to focus on achieving outcomes for waste recovery and waste management.
- Integrate policies regarding the management of oilfield waste and other industrial wastes to achieve shared environmental outcomes.
- Develop technical networks to support selection of the best recovery technologies for Alberta's waste and resource streams under Alberta's operating conditions.

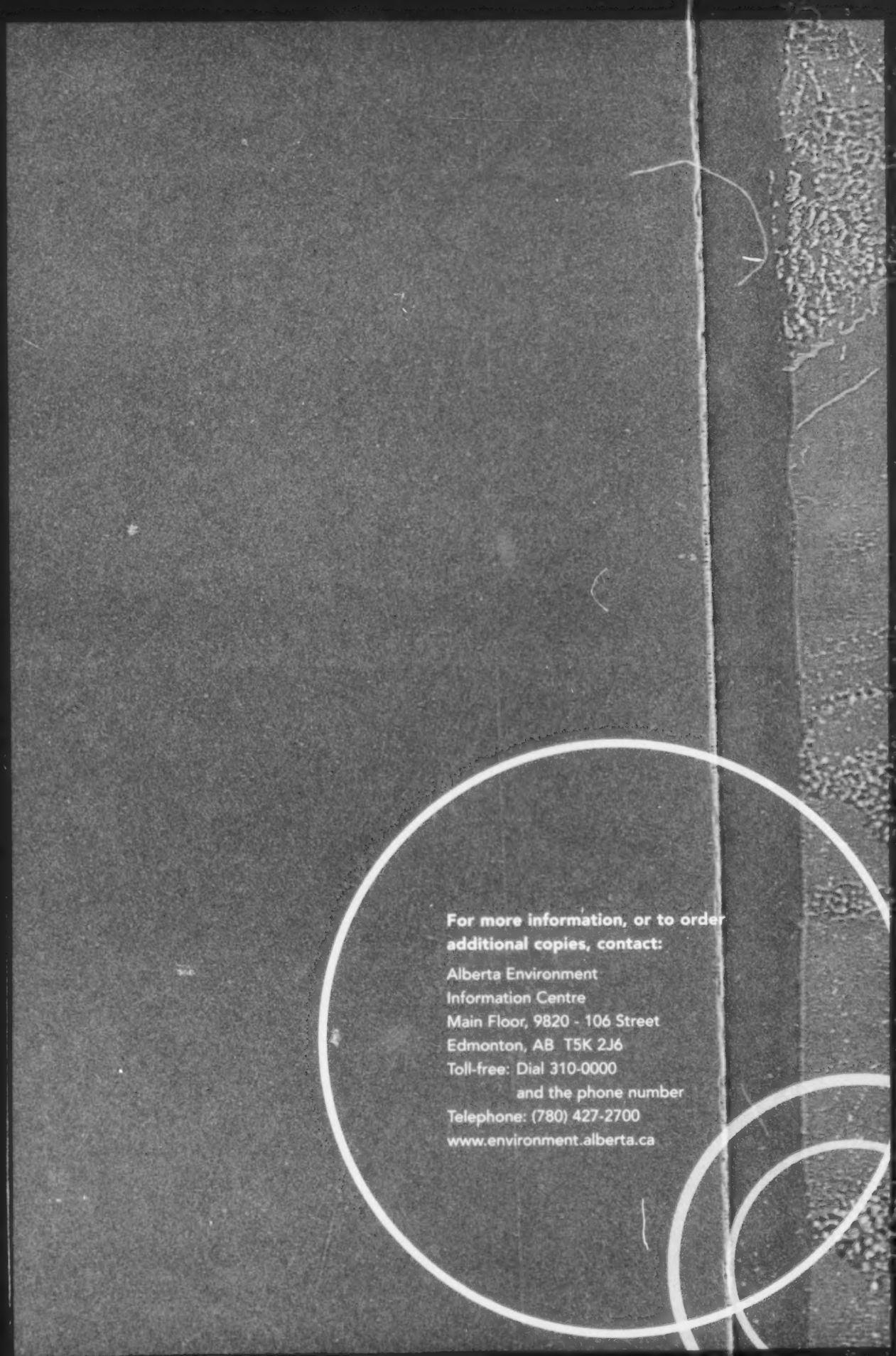
Measuring Performance to Ensure Success

Implementing *Too Good to Waste* will involve many partners outside of the Government of Alberta – municipalities, delegated administrative organizations, community not-for-profit groups, industry and individual citizens. Accountability remains with the Government of Alberta to assure Albertans that our desired outcomes – improved resource conservation and waste minimization, integrated resource recovery and waste management systems, and protection of environmental and human health – are being met.

Alberta Environment currently reports on a performance measure for the amount of waste disposed of at municipal landfills. The target for reducing municipal solid waste going to landfills is 500 kg per capita by the year 2010 (measured by collecting landfill disposal data from selected municipal landfills in Alberta).

Alberta Environment will continue to evaluate the performance target using disposal data from the same landfills that have been providing data to ensure consistent reporting/evaluation through to 2010. To supplement this data, Statistics Canada data will be used to evaluate changes in waste generation, diversion and disposal. Other available data will also be used to evaluate generation, diversion and disposal for specific MSW components: Residential; Industrial/Commercial/Institutional; and Construction and Demolition.

The current performance measure for hazardous waste reduction is the percentage of hazardous waste recycled. The current target is to increase the percentage of hazardous waste recycled beyond 70 per cent (approximately 70 per cent of hazardous waste in Alberta is currently recycled). Reporting by specific waste streams is required to better evaluate the generation of hazardous waste. Stakeholders have identified the need to reduce hazardous waste generation in addition to increasing recycling. Specific measures for each outcome will be developed in partnership with stakeholders as part of the implementation of specific strategies and actions.



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